Part 0 – MOST Introduction
1. Modeling

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Fakultät für Informatik

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http://st.inf.tu-dresden.de/teaching/most

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Literature

- Obligatory:
  - [HesseMayr] Wolfgang Hesse and Heinrich C. Mayr. Modellierung in der Softwaretechnik: eine Bestandsaufnahme. Informatik Spektrum, 31(5):377-393, 2008.
- References:
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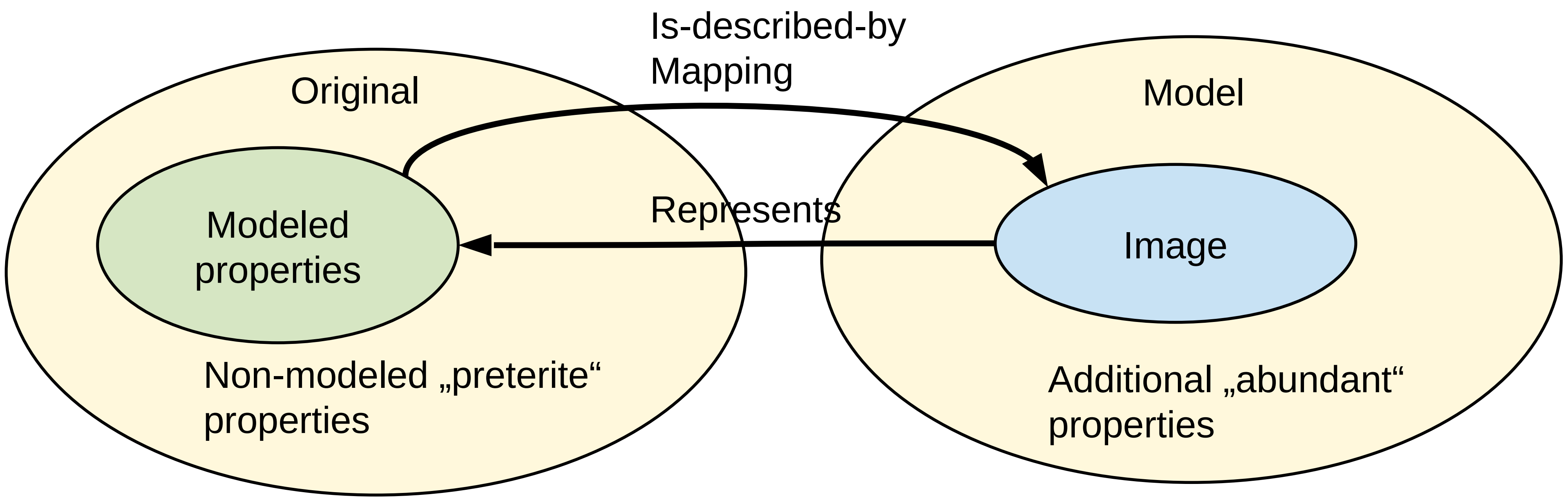
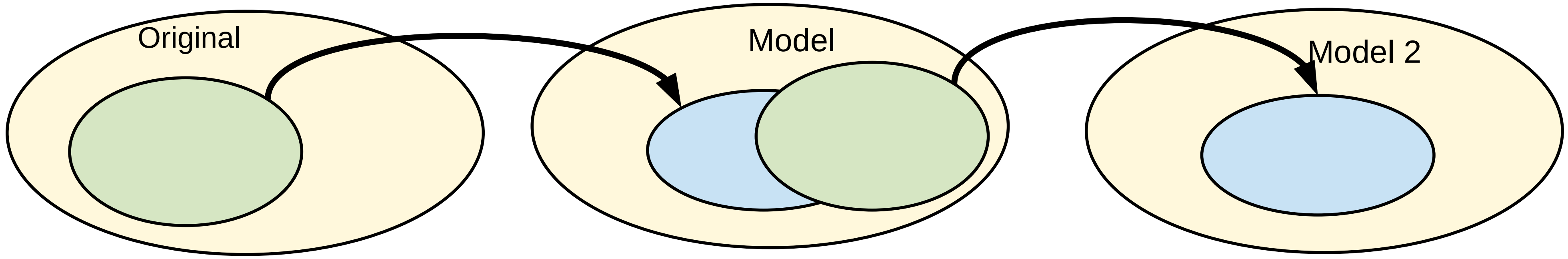
Original and Representing Model



- [HesseMayr, Stachowiak]
- Model mappings can be sequenced:



A **model** is an abstraction of an original [Stachowiak]

A **system model** is an abstraction of a system

A direct **model** is an abstraction of a reality

A **world model** is an abstraction of a world

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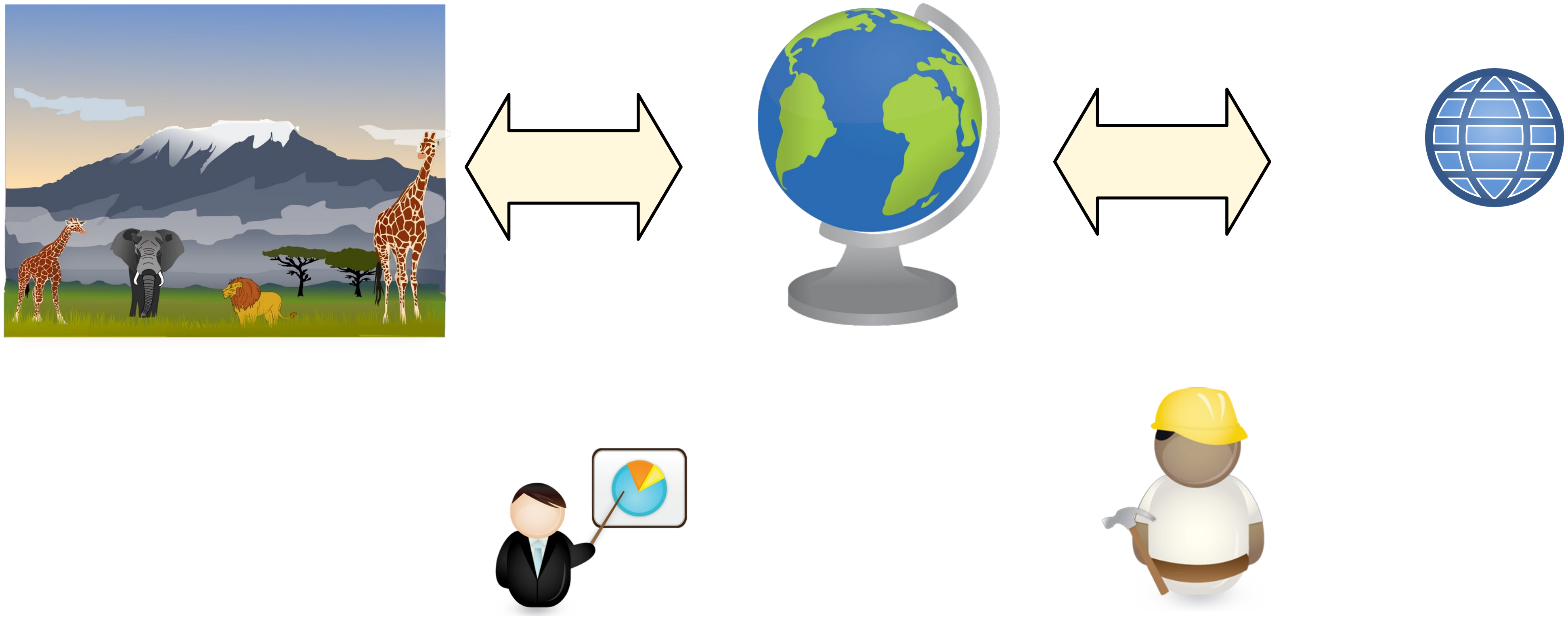


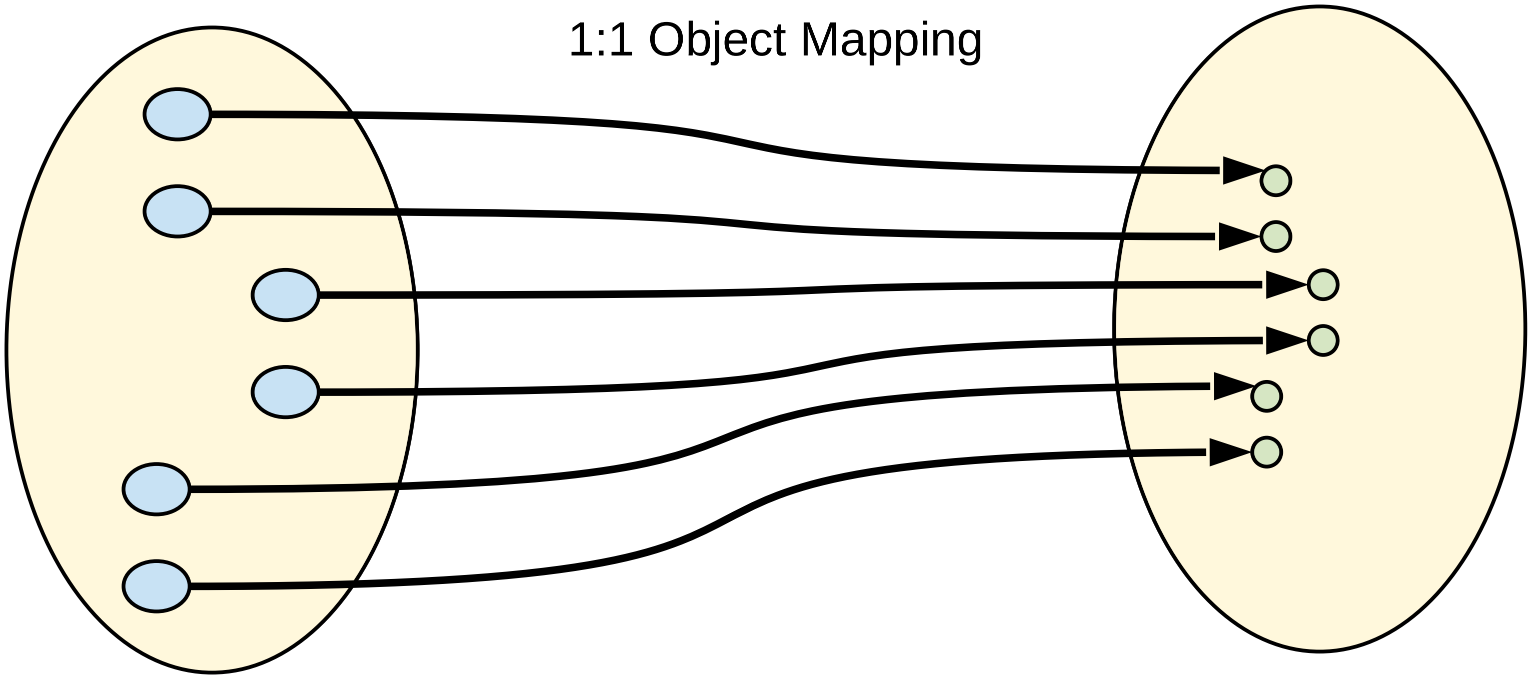
Descriptive Modeller

Prescriptive Modeler; Specifier; Implementer

[HesseMayr]

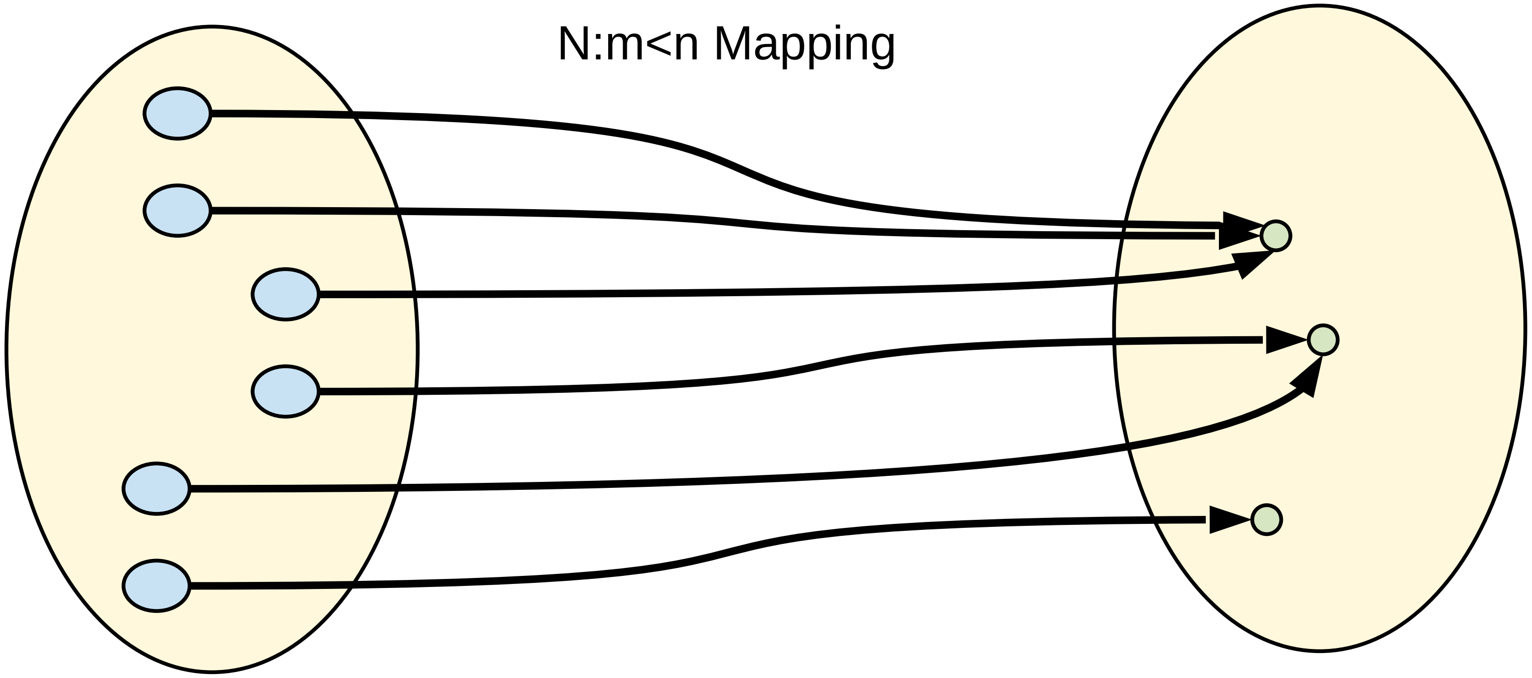
Token Modeling Provides Abstraction of Features of Objects

- In **Token modeling**, some features of the objects in original domain O are forgotten, but never the objects themselves
  - Abstraction over features
  - Leading to view-based modeling, aspect-oriented modeling



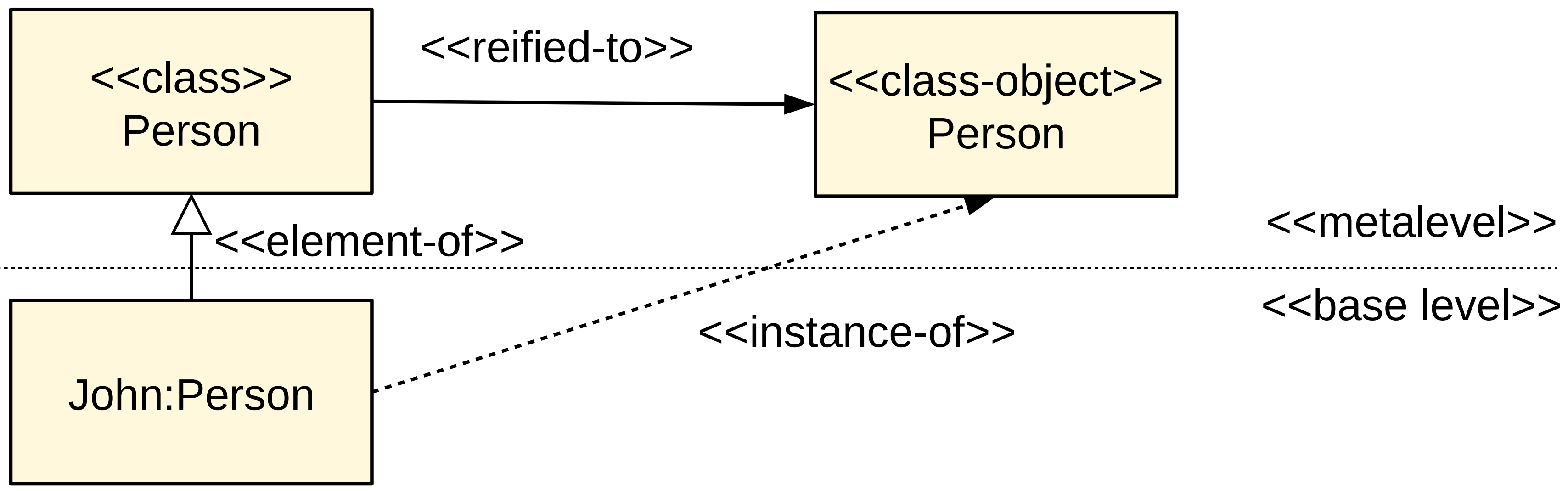
Type Modeling

- In **type modeling**, sets of objects are abstracted



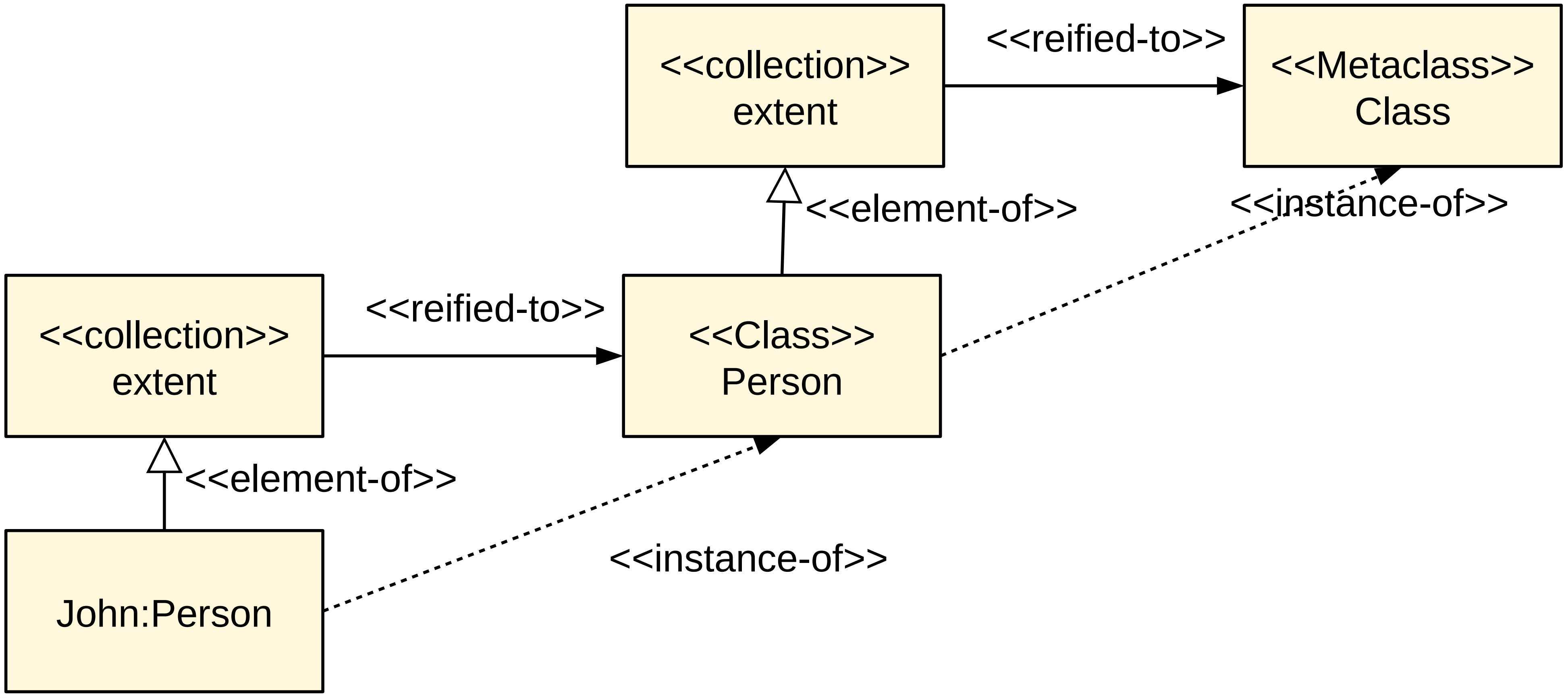
Type Modeling with Reification

- **Clabjects (class-objects)** are classes reified as *representant objects* on the metalevel.
  - In an object-oriented program, clabjects are objects that represent classes of other objects.
- Russells Paradox “The set of all sets containing themselves as elements” forbids infinitely many reifications
- <<instance-of>> is a composition of <<element-of>> with <<reified-to>>



Type Modeling with Reification Works over Several Levels: The Smalltalk Metaclass

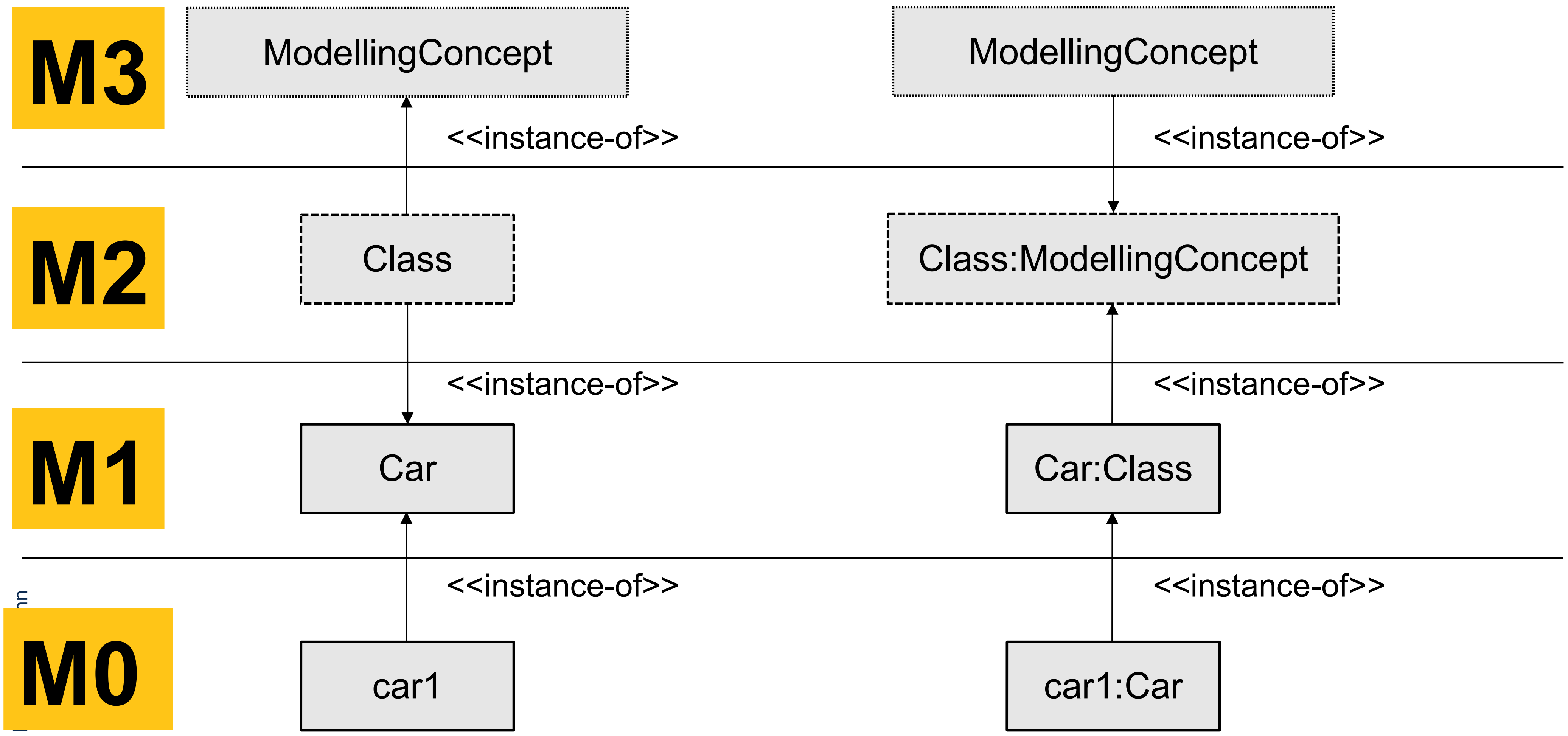
- Smalltalk-80 was the first language to introduce metamodeling
- It introduced **clabjects** as **class-objects** (and as **metaclasses).**
- Changing the Smalltalk metaclass changes the semantics of all classes and all objects.
- In Java, class `Class` is the metaclass, but it is immutable



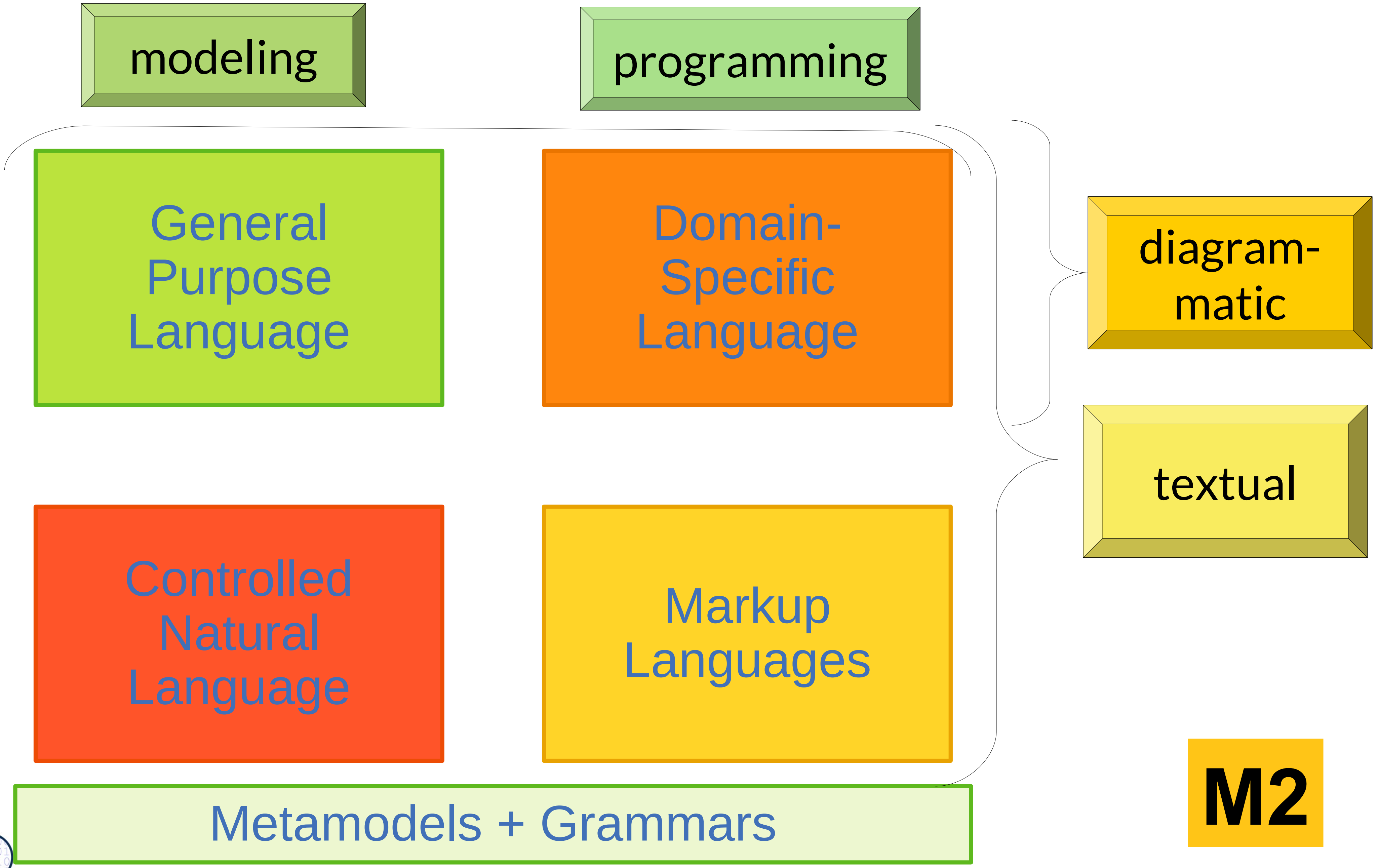
Notation

Clabject Hierarchy

- We write metaclasses with dashed lines, metametaclasses with dotted lines

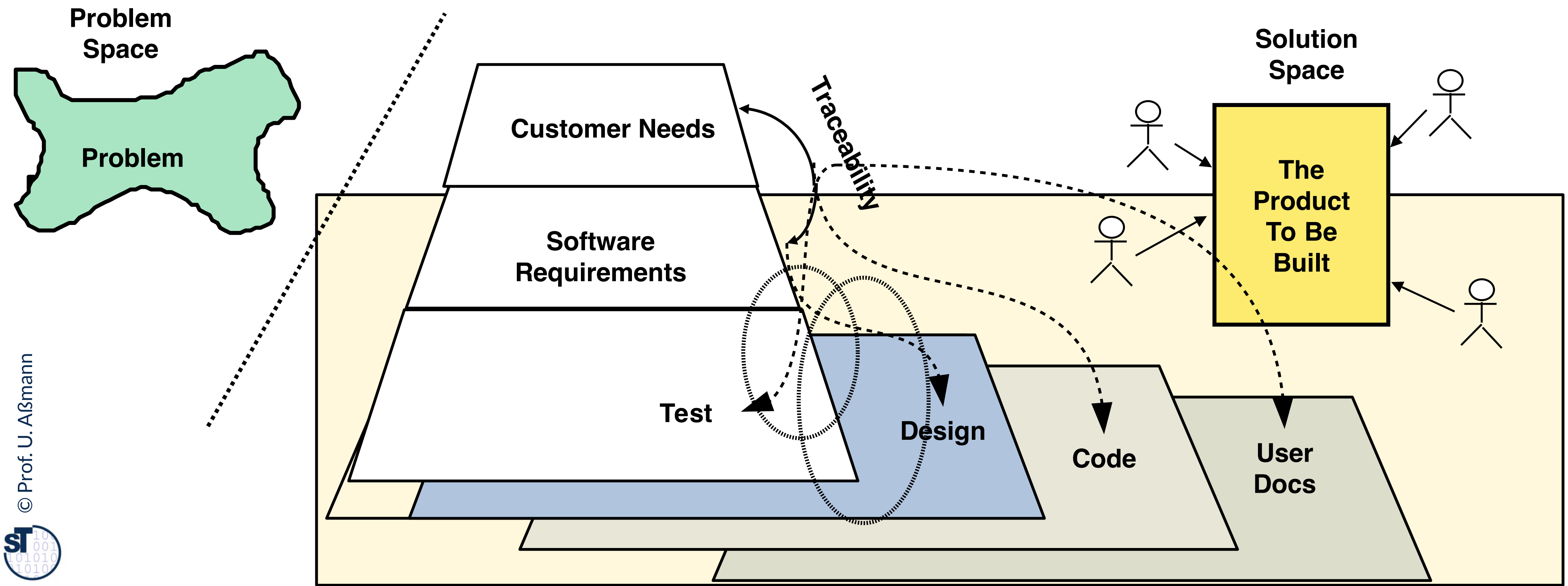


Q16: Languages in Software Factories are Built on Metamodels and Grammars

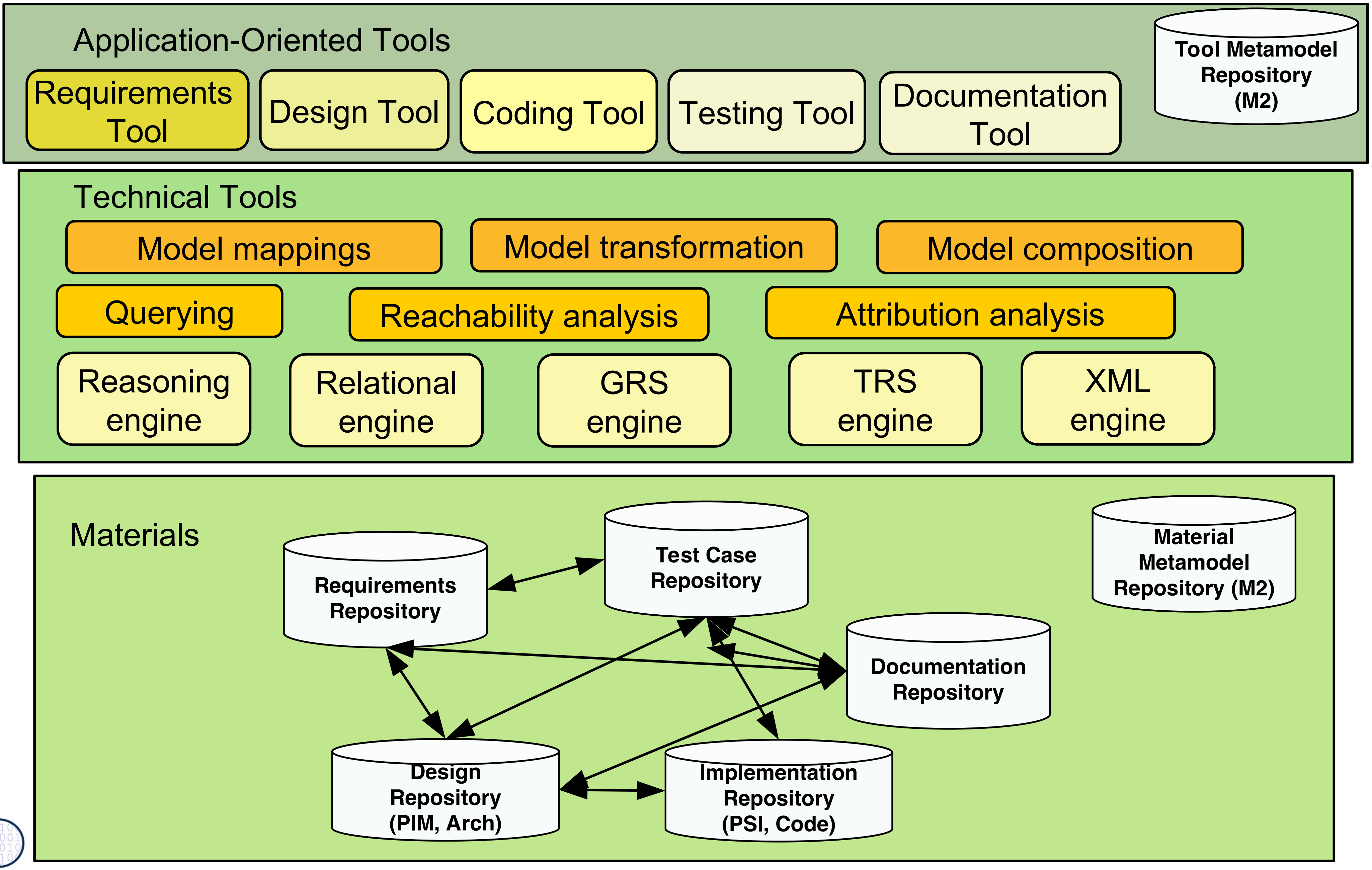


Q1: IDE and Model-Driven Software Development

- MDSD systematically connects the customer's problems, the system's requirements, testing, design, coding, and documentation and develops these models in coordination
- MDSD relies on model mappings between requirements, test cases, design, and code
- **Integrated Development Environments (IDE)** provide tools for all singular aspects, as well as model mappings



Q2: Tool-Objects and Materials in an Integrated Development Environment (IDE, SEU) for MDSD



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TECHNISCHE UNIVERSITÄT DRESDEN

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DRESDEN concept Exzellenz aus Wissenschaft und Kultur

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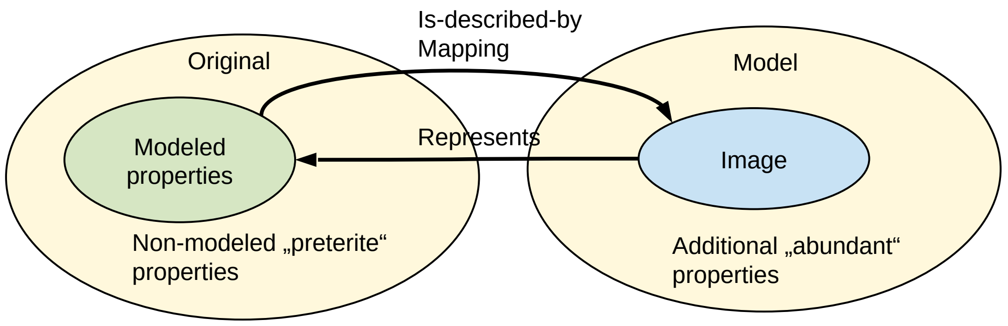

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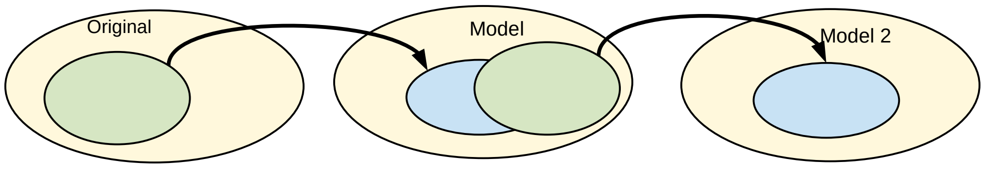

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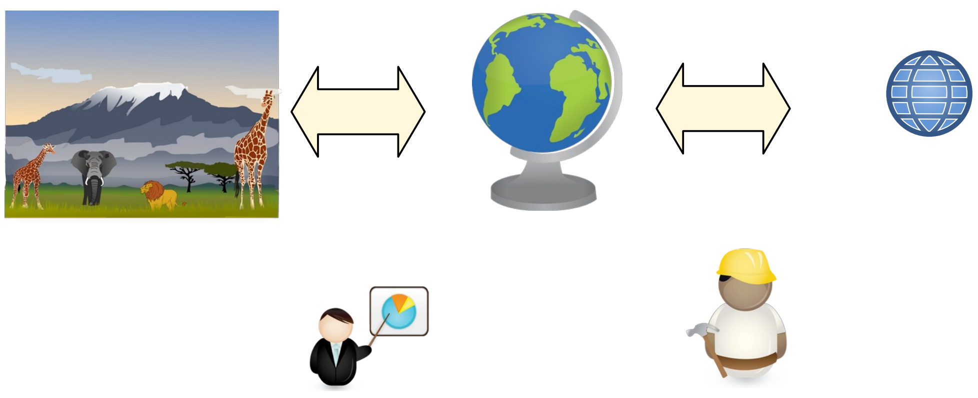

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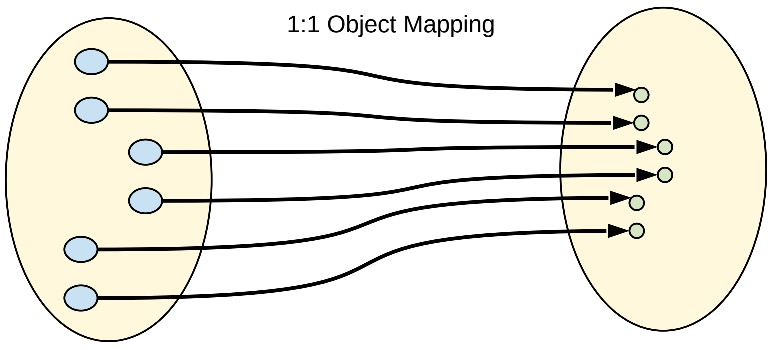

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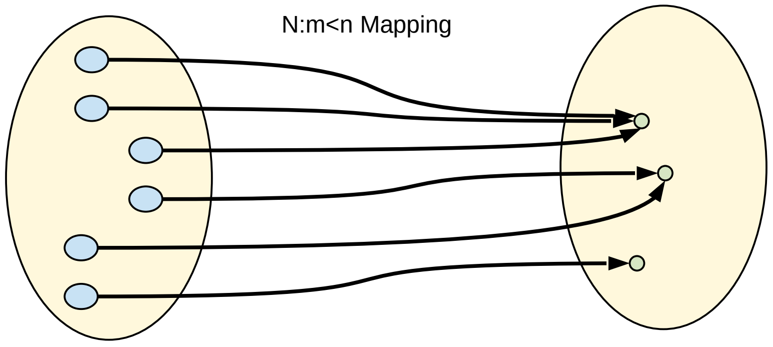

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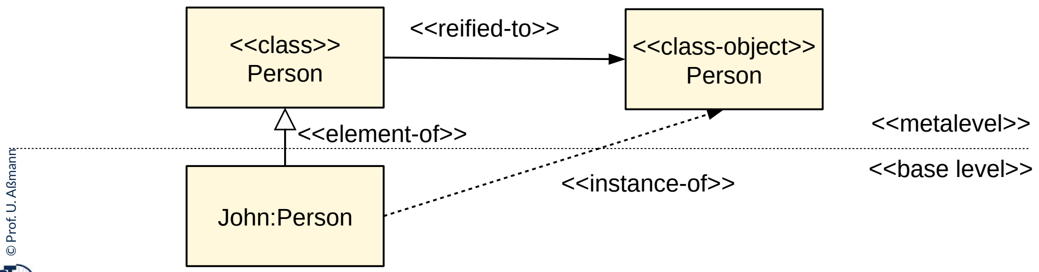

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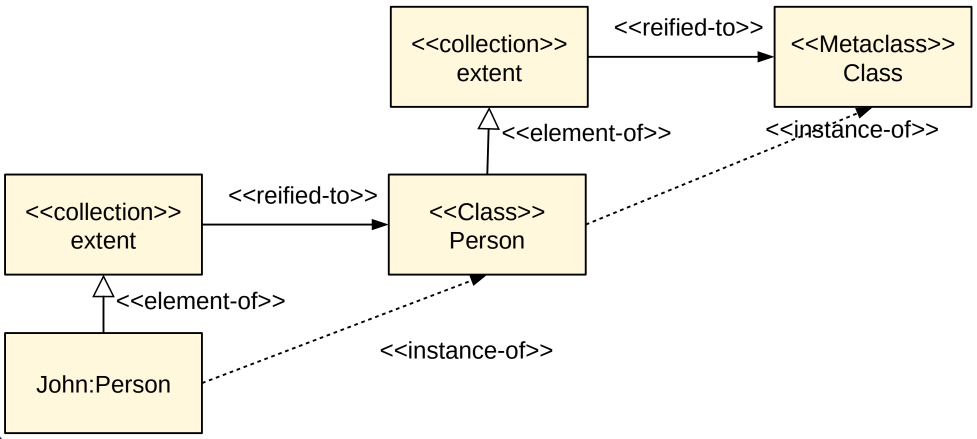

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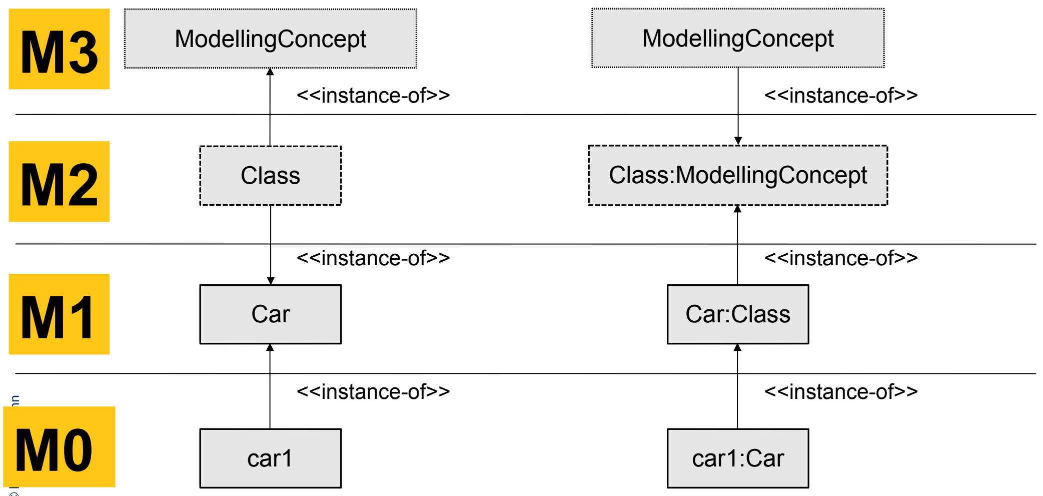

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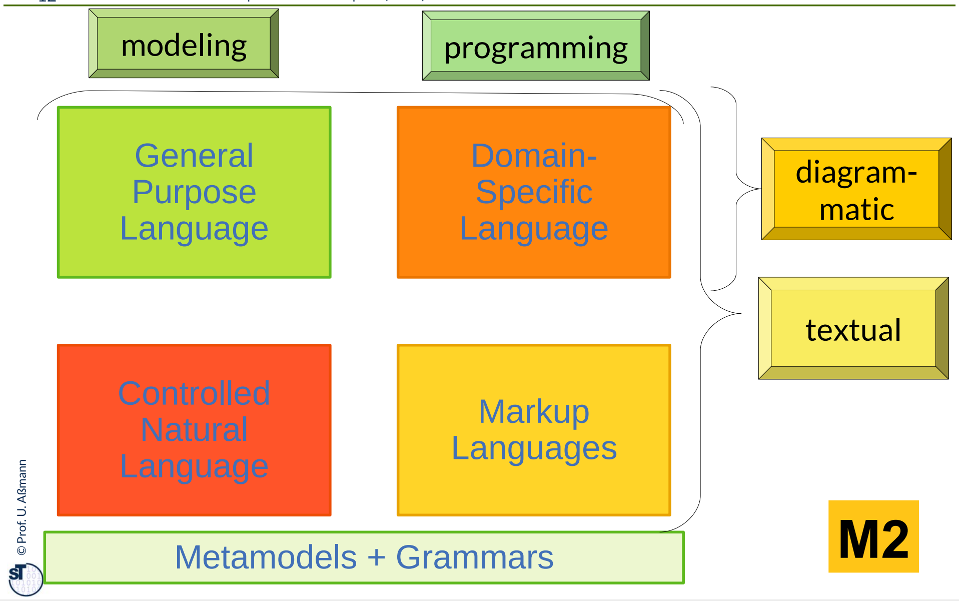

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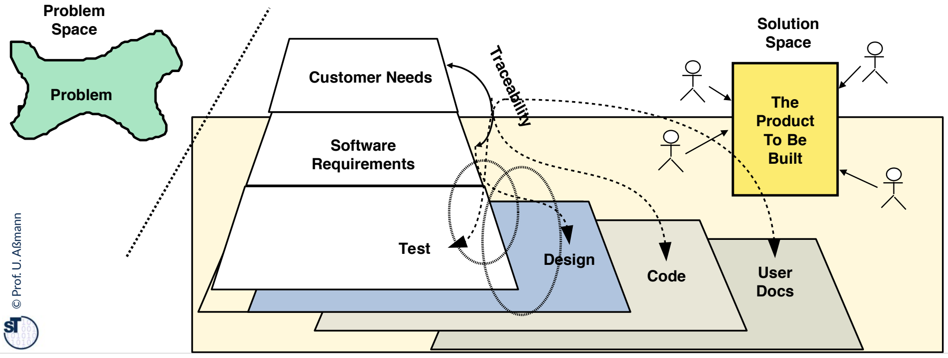

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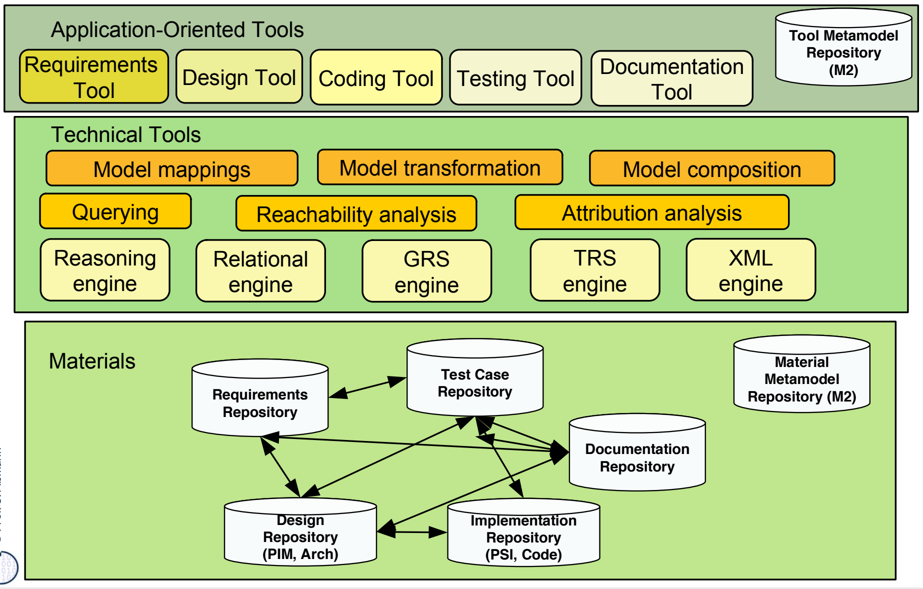

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